Nova Scotia
Department of
Mines and Energy

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POTENTIAL CRUSHED STONE DEPOSITS ON TIDEWATER IN NOVA SCOTIA

by

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INTRODUCTION

In 1986 production of crushed stone from Nova Scotia quarries was **4.9 million tonnes**. Of the total, 80% was used for domestic consumption while 20% was exported. The export stone was produced by **Construction Aggregates Limited** at their quarry near Port Hawkesbury. Construction Aggregates Limited established a granite quarry at Porcupine Mountain, Port Hawkesbury in 1978 and produce about 1 million tonnes of aggregate annually. Over 90% of their production is exported and shipped by bulk ocean carrier to destinations such as Bermuda and several ports in the United States including Savannah, New Orleans and Huston.

Aggregate is shipped into the United States from points in Europe utilizing cost effective back haul bulk carriers. Nova Scotia is very well situated on great circle shipping routes to Europe (Fig. 1) and on established shipping routes to the United States Eastern Seaboard and Gulf coast. Consumption of aggregates is increasing in the United States and this trend is to continue. Nova Scotia is ideally situated to take advantage of this market. The information contained in this report describes **five locations** (Fig. 2) where **deposits of aggregate quality rock suitable for the export market occur.**

SCOPE

Site selections of potential crushed stone deposits were based on the following criteria:

1. **Rock types** - The types of rock selected for potential crushed rock sites were granite and greywackes. Fine to medium grained granites were preferred in sites of low tectonic disruption with a minimum of quartz, and/or pegmatite veins, dykes and bodies of country rock. The one greywacke site tested was selected because of a new deep water common user dock at the site. The greywacke is similar to the rock in the major aggregate quarries in the Halifax-Dartmouth area.

2. **Topography** - Sites selected have a minimum of 150 feet of elevation above tide water (A.S.L.) with a preference towards relief of over 300 feet A.S.L.

3. **Water depth** - Sites selected are adjacent to 40 feet minimum tidewater within 500 feet of the shore.

4. **Property Ownership** - Preference was given to sites held by the Crown with no development restrictions.

Figure 1. Nova Scotia and world shipping routes.

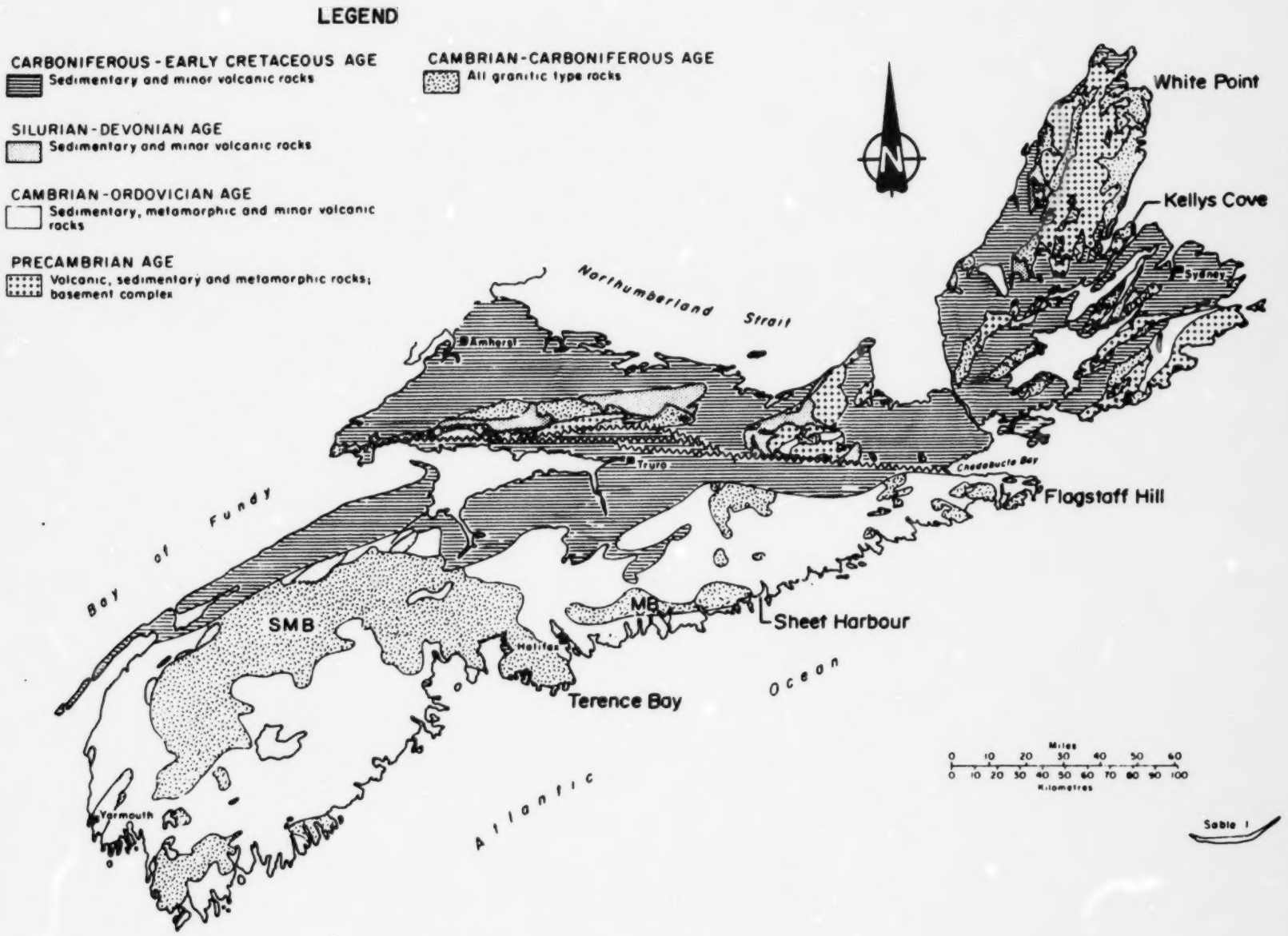

Figure 2. Locations of potential crushed stone deposits in Nova Scotia.

LABORATORY TESTING

Once sites were selected for further evaluation, reconnaissance sampling and mapping was carried out. Samples of fresh material were obtained using portable drilling equipment. Approximately 100 pounds was at each site for lab tests. Each sample was crushed in a laboratory jaw crusher to minus 20 mm and splits were taken to conduct the following tests:

Los Angeles Abrasion Loss was carried out in accordance to ASTM C131 for a "B" grading. Samples were crushed to 20 mm, the appropriate sizes selected and the material placed in the drum with 11 spheres and revolved 500 times. The loss was measured as the percentage of material passing the #12 mesh screen.

Sodium Sulphate Soundness Loss tests were carried out in accordance to ASTM C-88-83. The loss was reported as the percentage of material passing the #5 sieve.

Petrographic Number was determined in accordance with the modified Department of Highways of Ontario specification after ASTM C-294 and 295.

Polished Stone Value was determined in accordance with BS 812 - 1975 and 1983 at the Engineering Materials Office, Ontario Ministry of Transportation and Communications. It is important to note the differences between values reported according to the British specifications and those values reported according to the ASTM and modified ASTM methods used in the United States. The British method tends to produce higher numerical values.

SURFACE AND MINERAL RIGHTS

This report presents information on sites with potential for developing crushed stone quarries. It is <u>not</u> asking for or soliciting proposals for development of the properties.

All minerals in Nova Scotia are reserved to the **Crown** under **The Mineral Resources Act**. Stone, sand, gravel, peat, gypsum, many limestone deposits, oil, natural gas and ordinary soil are not Crown Minerals under the current act. Exploration for oil and natural gas is regulated by the Petroleum Resources Act and like mineral rights are conveyed through a similar licensing procedure.

In order to open and operate a crushed rock quarry, the surface rights for the property must be held by the owner/operator of the quarry or arrangements must be made with the land owner to develop the quarry. Surface rights to several of the sites identified in this report are held by the Crown. In order to open a rock quarry on Crown land it is necessary to deal with the Crown as the land owner and negotiate access. **The Nova Scotia Department of Lands and Forests administers Crown lands** in Nova Scotia.

One of the sites identified in this report is held by a private corporation. Surface rights and access must be negotiated with the private land owner just as Crown land access is negotiated with the Department of Lands and Forests.

RESULTS OF FIELD PROGRAM 1987

Analytical data and other relevant information is presented on each deposit in tabular form with a map depicting the deposit configuration, geology, topography, surface ownership and bathymetry. Additional detailed information on each deposit is available through the Department of Mines and Energy.

KELLYS COVE
(Fig. 3)

ROCK RESERVES	Cambrian red leucogranite	2.2 billion tonnes	
PHYSICAL PROPERTIES	Los Angeles Abrasion 27.4%	Soundness 4.28%	PSV 50.5
LOCATION	The deposit is located 5 km north east of trunk 105 at the Seal Island bridge on the south flank of Kellys Mountain, Victoria County, Cape Breton.		
ACCESS	Tidal water shipping through the Great Bras d'Or channel with a present maximum draft restriction of 27 feet. The deposit is adjacent to a gravel road which links to the Trans Canada Highway system.		
STATUS	Surface rights held under agreement by Mosher Limestone, Upper Musquodoboit, Halifax County. The mineral rights are not currently held.		
LANDUSE LIMITATIONS	Within sight of the Trans Canada Highway.		

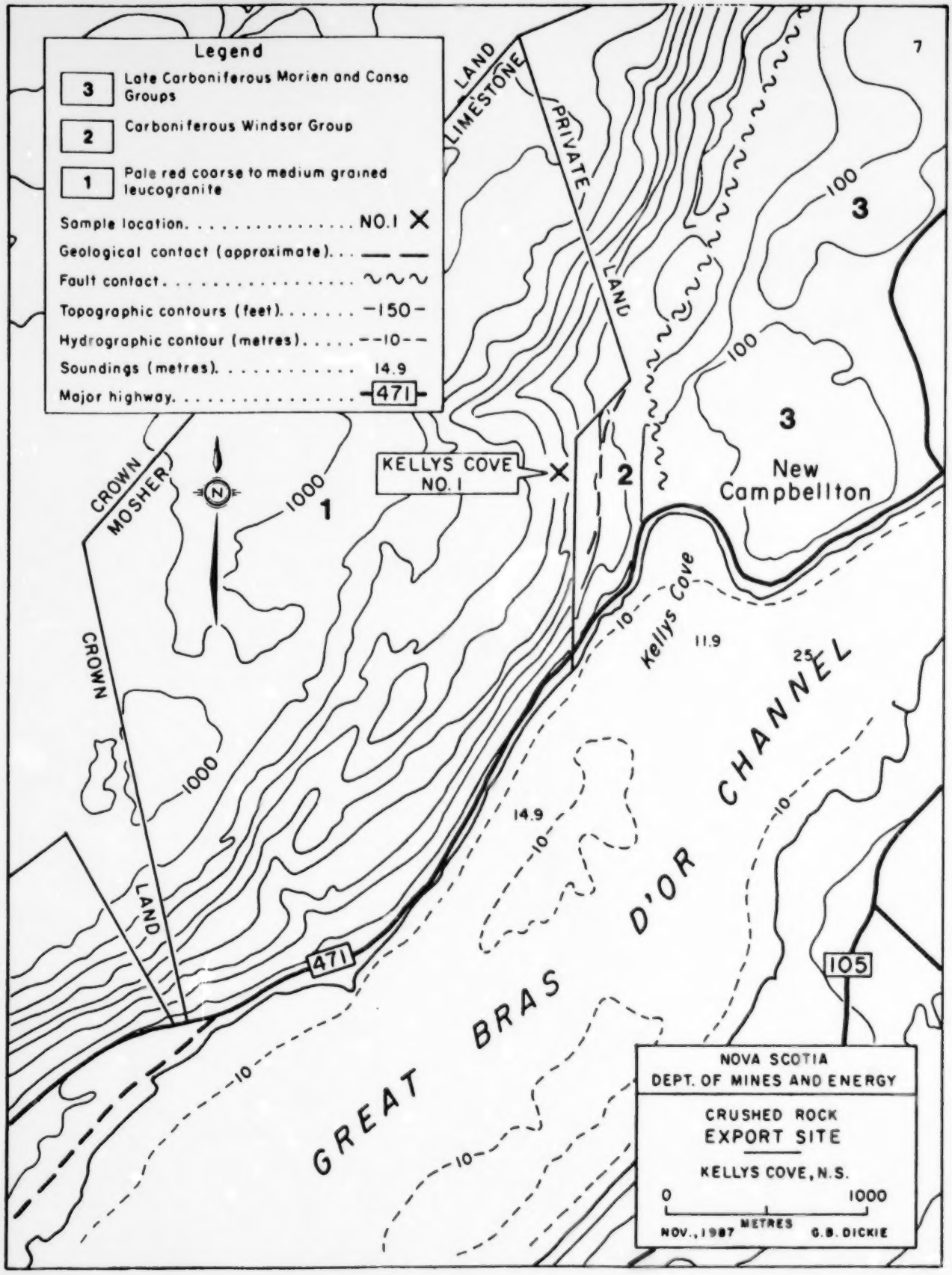

Figure 3. Geology, topography, bathymetry surface rights compliation - Kellys Cove, Victoria County.

WHITE POINT
(Fig. 4)

ROCK RESERVES	Cambrian pale red medium grained leucogranite	400 million tonnes		
PHYSICAL PROPERTIES	Los Angeles Abrasion	Soundness	Petrographic	PSV
	36.5%	0.3%	101.2	51
LOCATION	The deposit is located 1 km east of the village of White Point, Victoria County on the Atlantic Ocean.			
ACCESS	The deposit is located on 40 feet tidal water within 500 feet of the shoreline. A paved highway passes within 1 km of the site.			
STATUS	Surface rights are held by the Crown. Mineral rights are not held.			
LANDUSE LIMITATIONS	Although near the scenic Cabot Trail, the proposed site is not visible from the highway.			

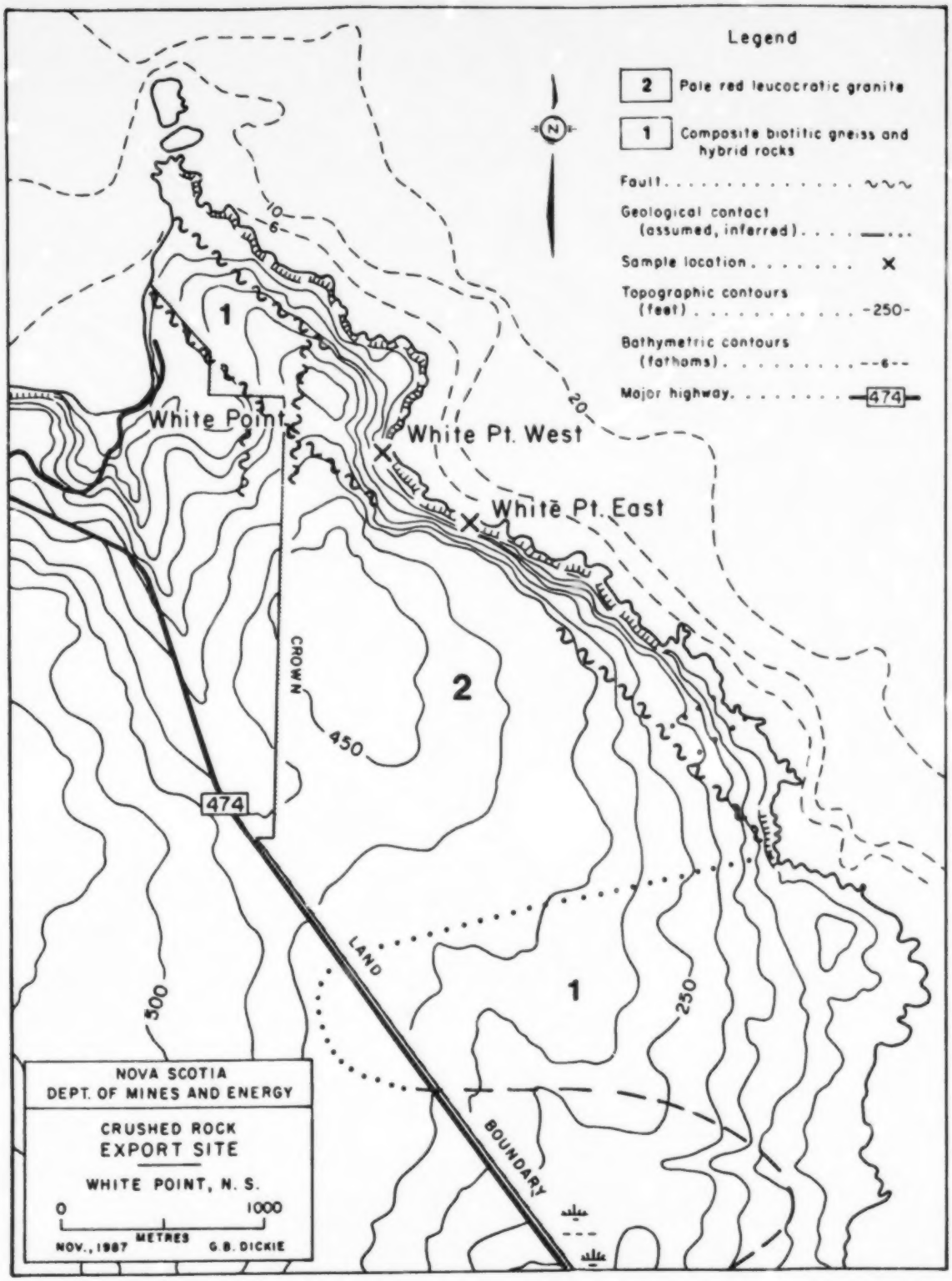

Figure 4. Geology, topography, bathymetry, surface rights compilation - White Point, Victoria County.

SHEET HARBOUR
(Fig. 5)

ROCK RESERVES

Cambro-Ordovician greywacke — >500 million tonnes

PHYSICAL PROPERTIES

Los Angeles Abrasion	Soundness	Petrographic	PSV
18.2%	0.1%	182	56

LOCATION

The deposit is located 2 km south east of the village of Sheet Harbour, Halifax County at the site of the Sheet Harbour Common User Dock.

ACCESS

Tidal water shipping from the newly constructed common user dock with 38 feet water depth. Paved highways link with Highway #7.

STATUS

Surface rights are held by the Crown through the Department of Development, Department of Lands and Forests and Nova Scotia Power Corporation. Mineral rights are held on a portion of the deposit.

LANDUSE LIMITATIONS

Development plans in place and forecast for the area may conflict with a crushed rock quarry.

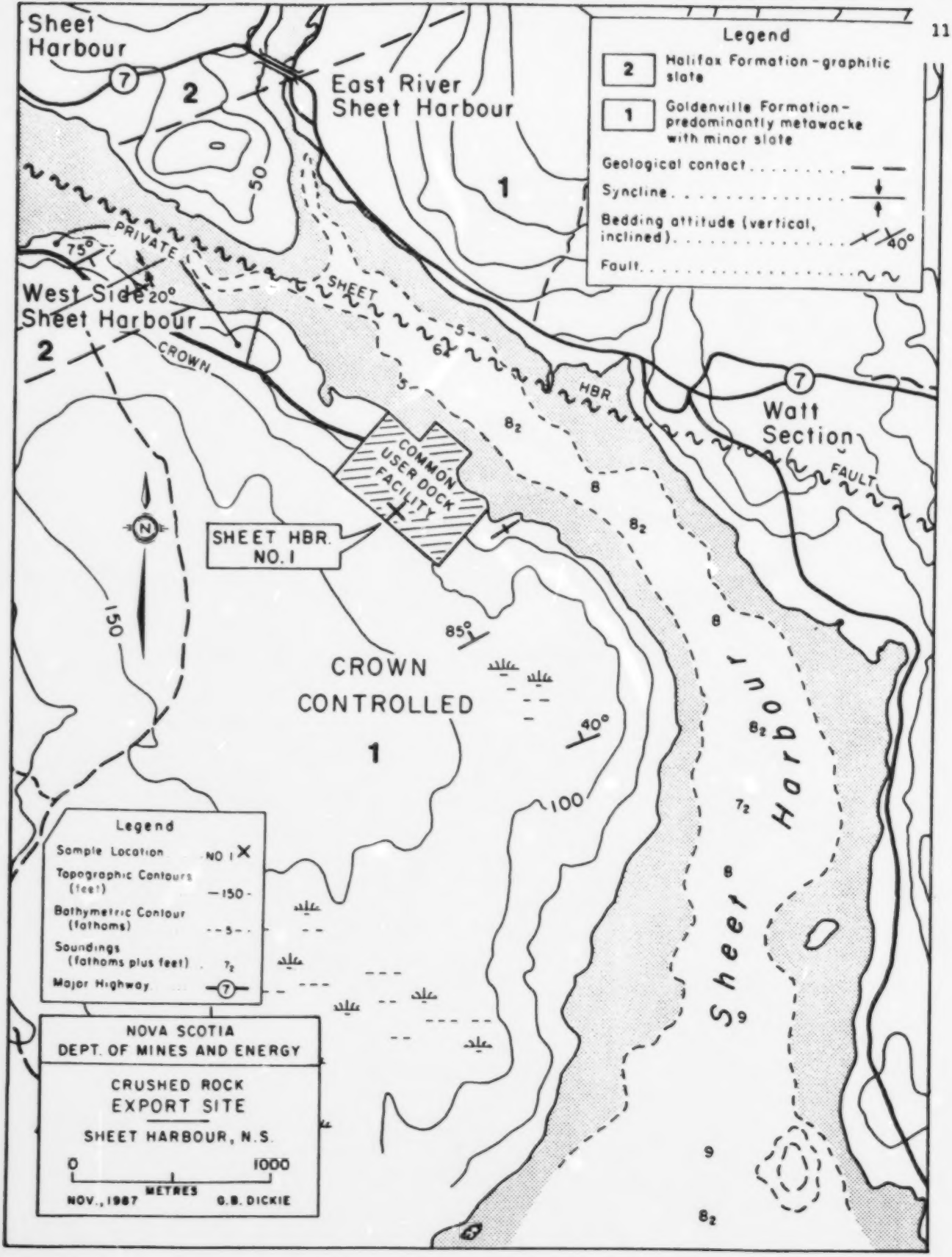

Figure 5. Geology, topography, bathymetry, surface right compilation - Sheet Harbour, Halifax County.

FLAGSTAFF HILL
(Fig. 6)

ROCK RESERVES

Devonian medium grained biotite - muscovite granite >500 million tonnes

PHYSICAL PROPERTIES

Los Angeles Abrasion	Soundness	Petrographic	PSV
36.6%	1.3%	112.0	51

LOCATION

The deposit is located 2 km south east of Upper Whitehead, Guysborough County off highway 316.

ACCESS

The deposit is located on 40 feet of tidal water near the shoreline. There is no road access to the site although paved highway 316 passes within 2 km of the site across the northwest branch of Whitehead Harbour.

STATUS

Surface rights are held by the Crown. Mineral rights are not held.

LANDUSE LIMITATIONS

None at this time.

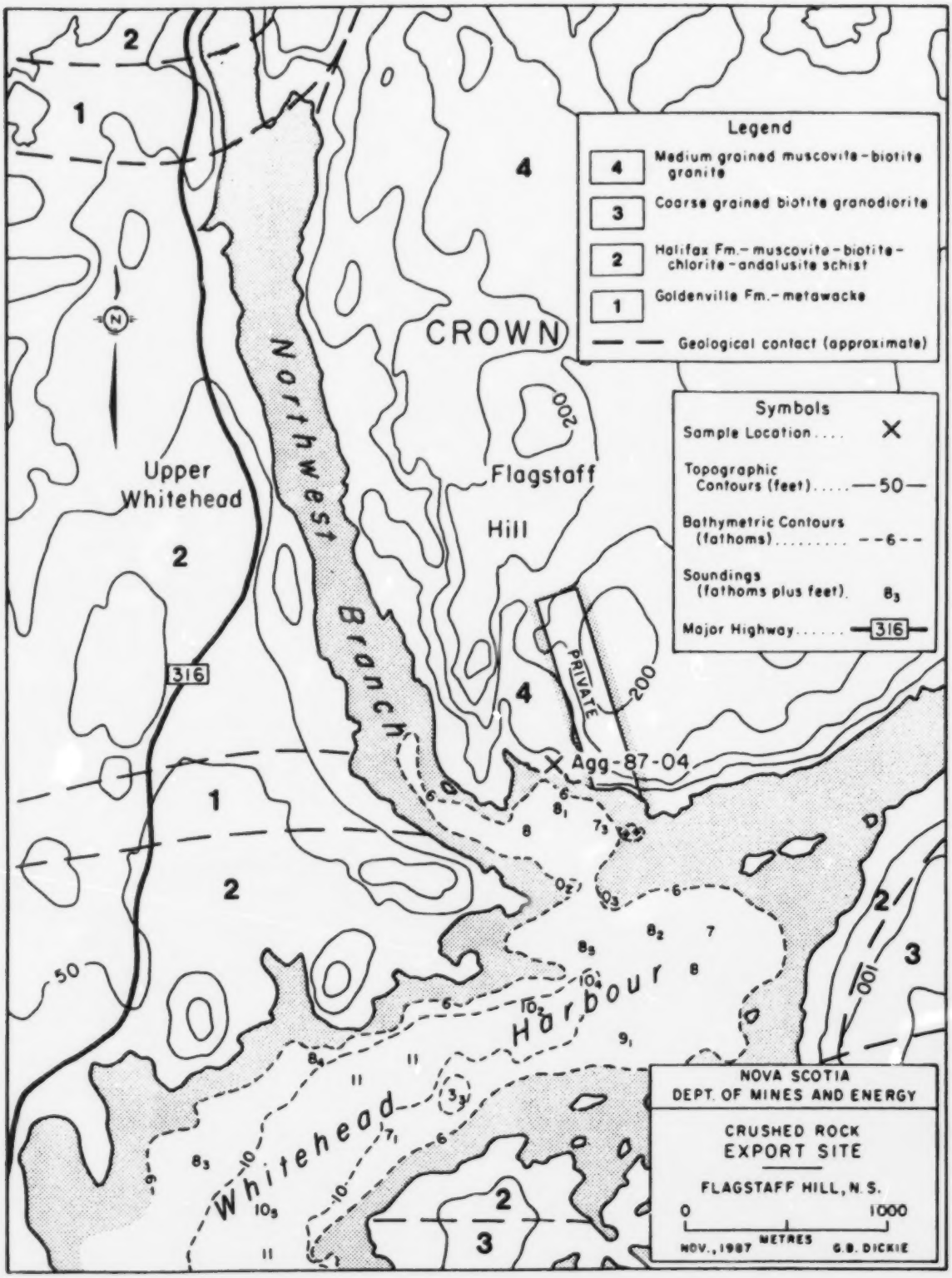

Figure 6. Geology, topography, bathymetry, surface rights compilation - Flagstaff Hill, Guysborough County.

TERENCE BAY
(Fig. 7)

ROCK RESERVES	Devonian medium to coarse grained porphyritic monzogranite	>1 billion tones			
PHYSICAL PROPERTIES	Los Angeles Abrasion	Soundness	Petrographic	PSV	
	44.0%	0.3%	122.6	50.0	
LOCATION	The deposit is located on the east side of Terence Bay Harbour, Halifax County.				
ACCESS	Tidal water at the site with depths of 40 feet within 100 metres of the shore. Paved roads pass within 500 metres west of the site across Terence Bay River.				
STATUS	Surface rights held by the Crown designated Park Reserve. Mineral rights held under closure by the Nova Scotia Department of Mines & Energy.				
LANDUSE LIMITATIONS	Lands designated "Park Reserve" may pose conflict with the Nova Scotia Department of Lands and Forests.				

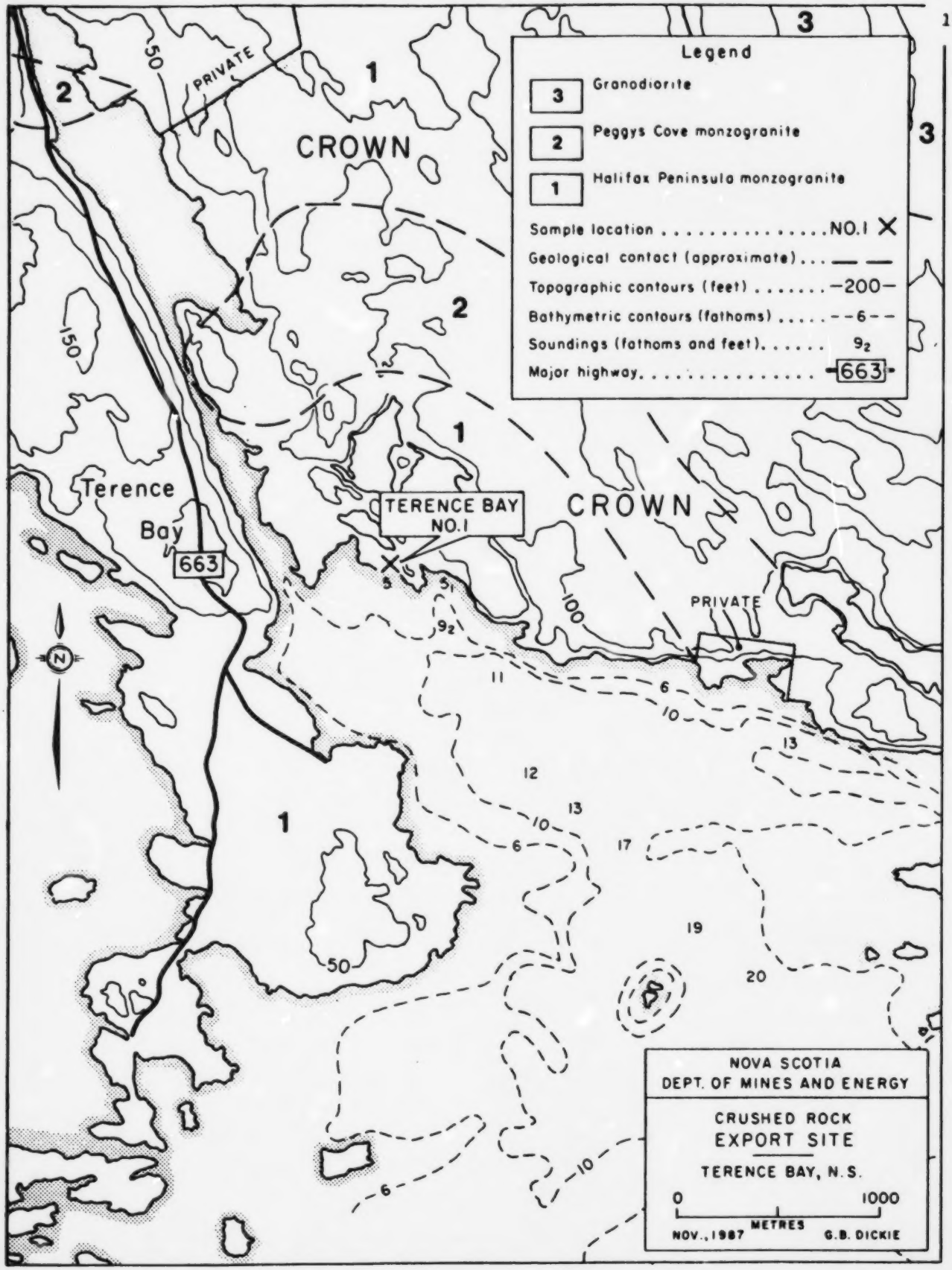

Figure 7. Geology, topography, bathymetry surface rights compilation - Terence Bay, Halifax County.